

## COS 301 Prelim 1 Fall 2011

### Essay Question

#### Discussion / Essay Question

This question is 10 points of your Prelim 1 exam grade. Submit printed copies in class Thursday Oct 20 at 11AM (or electronic copies by email if unable to attend class). Answers should be roughly 1-2 printed 1.5-spaced pages; more is acceptable. Cite references if you use them; answering questions with your own knowledge without using references is fine. The grade will be 50% content and 50% technical writing.

1. It has been stated (although not proven in class) that all computer languages are fundamentally equivalent in terms of the problems that they can solve – none are more powerful than a Turing machine. Yet there exist clear reasons to choose one language over another for programming or part of a system.

**Select two of the systems listed below** indicate what the criteria for selecting a programming language might be and select one more languages. You may simply list criteria but you can also argue for a particular language if desired. You may find reasons to use different languages for different parts of any one system. Write one-half to one page on each application.

A. A home electricity monitoring system that allows users to monitor their home electricity usage on the web as well as schedule and control appliances and alternative power sources such as solar panels. The monitor reports mains voltage, and for each circuit both real and apparent power consumption once per minute. Readings are stored for display and analysis.

B. A data mining system for public health designed to detect possibly dangerous disease outbreaks that could develop into pandemics or epidemics. The primary inputs to the system are dates and diagnostic codes submitted to Medicare, Medicaid and private insurers.

C. An reading level translator designed to make text easier to read by shortening sentences and substituting words and phrases. For example the system might replaces "utilize" with "use" "at this point in time" with "now."

D. An automated system for music analysis that accepts a sound file as input and determines what instruments are being played.

E. A front-end data entry system for hospital physicians to enter data into electronic medical records while at the patient bedside.